

Claim Rejection 35 U.S.C. 103(a)

Claims 1-35 were rejected under 35 U.S.C. 103(a) as being unpatentable over Voelskow et al. (U.S. Patent No. 4,467,034) in view of Hammond (WO 95/32301) and Walkup et al. (U.S. Patent No. 5,252,473).

The Examiner alleges it would have been obvious for the skillful artisan to have used Hammond's anion exchanger followed by Voelskow et al.'s cation exchanger, along with Walkup et al.'s hydrolysis and distillation in order to increase the efficiency of the overall process. Applicants respectfully traverse this rejection.

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art, *In re Royka*, 490 F.2d 981, USPQ 580 (CCPA 1974).

The present invention relates to a process for the recovery of lactic acid from a lactate salt containing solution. The process comprises contacting the solution with a cation exchanger which is at least partially in its acid form so that an ion exchange is effected whereby protons are transferred from the cation exchanger to the aqueous solution where they bind with the lactate anions to form lactic acid and cations from the solution are transferred to the cationic exchanger to form cations carrying cation exchanger. (See page 5, line 24-page 6, line 3).

Subsequently, the cations carrying cation exchanger is converted into a cation exchanger, which is at least partially in its acid form, and a second product is formed wherein the second product is basic and comprises the cation of the salt. (See step b) of claim 1 and page 7, lines 4-24).

Voelskow et al. describes a process for the production of D-lactic acid. The process comprises reacting sodium lactate solution with ion exchanger columns wherein the columns adsorb the lactic acid. Once the columns are loaded with lactic acid, they are eluted with hydrochloric acid and regenerated with dilute sodium hydroxide solution so

that the columns can be reused (see col. 5, line 29 to col. 6, line 3). The process described in Voelskow et al. consumes hydrochloric acid and sodium hydroxide and thus teaches away from the present invention, which, as explained above, describes a process that regenerates the cation exchanger without the consumption of a base or acid.

Hammond et al. describe both passing a feed solution through a column of an anion exchanger regenerated with alkali metal hydroxide and mentions *inter alia* that if acid is desired in the end product, the alkali metal salt solution is passed through a column of a cation exchanger in hydrogen ion form to yield an acid.

Hammond et al. neither teach nor suggest the use of the cation exchanger as defined in the present invention which is regenerated by reacting the cations carrying cation exchanger to convert it into a cation exchanger which is at least partially in its acid form and to a second product, which second product is basic and comprises the cation of said salt.

Furthermore, Hammond et al. teaches away from the present invention, which, as explained above, describes a process that regenerates the cation exchanger without the consumption of a base or acid.

It is to be noted that the teachings of Walkup et al. cannot supplement the deficiencies in the primary references. On page 4 of the Office Action, the Examiner describes his understanding of the teaching of Walkup et al. as follows "Furthermore, purified lactic acid can be produced from CO₂ catalysis of ammonium lactate and alcohol solution in the presence of an acid ion exchange resin at a temperature in the range of 100°C to 150°C." However, this is not an accurate interpretation of Walkup et al. because it is the purified lactic acid ester that is produced from the CO₂ catalysis of ammonium lactate and alcohol solution, (see col. 14, lines 26-28). This purified ester can then be hydrolyzed in the presence of an acid ion exchange resin at a temperature in the range of 100°C to 150°C, to form lactic acid and alcohol, (see col. 14, lines 36-39).

Furthermore, it is to be noted that the cation exchanger described by Walkup is used as a catalyst and has no ion exchange role in the process described.

It would not have been obvious to the skillful artisan to use the teachings of the cited prior art references to achieve the process of the present invention. Therefore, the present invention is nonobvious over the combined teachings of the cited references.

In light of the above, Applicants submit that all rejections of record have been overcome. Applicants accordingly submit that the application is now in condition for allowance and respectfully request action in accordance therewith.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Janet I. Cord", with a long horizontal flourish extending to the right.

Janet I. Cord

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